

Nueces Delta

Landform and Hydraulic Modifications:

Phase II – Verification and Feasibility Assessment

Presentation to the Nueces Estuary Advisory Council -- October 17, 2016



Naismith/Hanson

Engineering | Planning | Architecture | Allied Services

Now a part of Hanson Professional Services, Inc.



Project Objectives

To increase the area and duration of freshwater inundation of wetland areas within the Nueces Delta during **Freshwater Inflow Pass-Thru Pumping Events**.



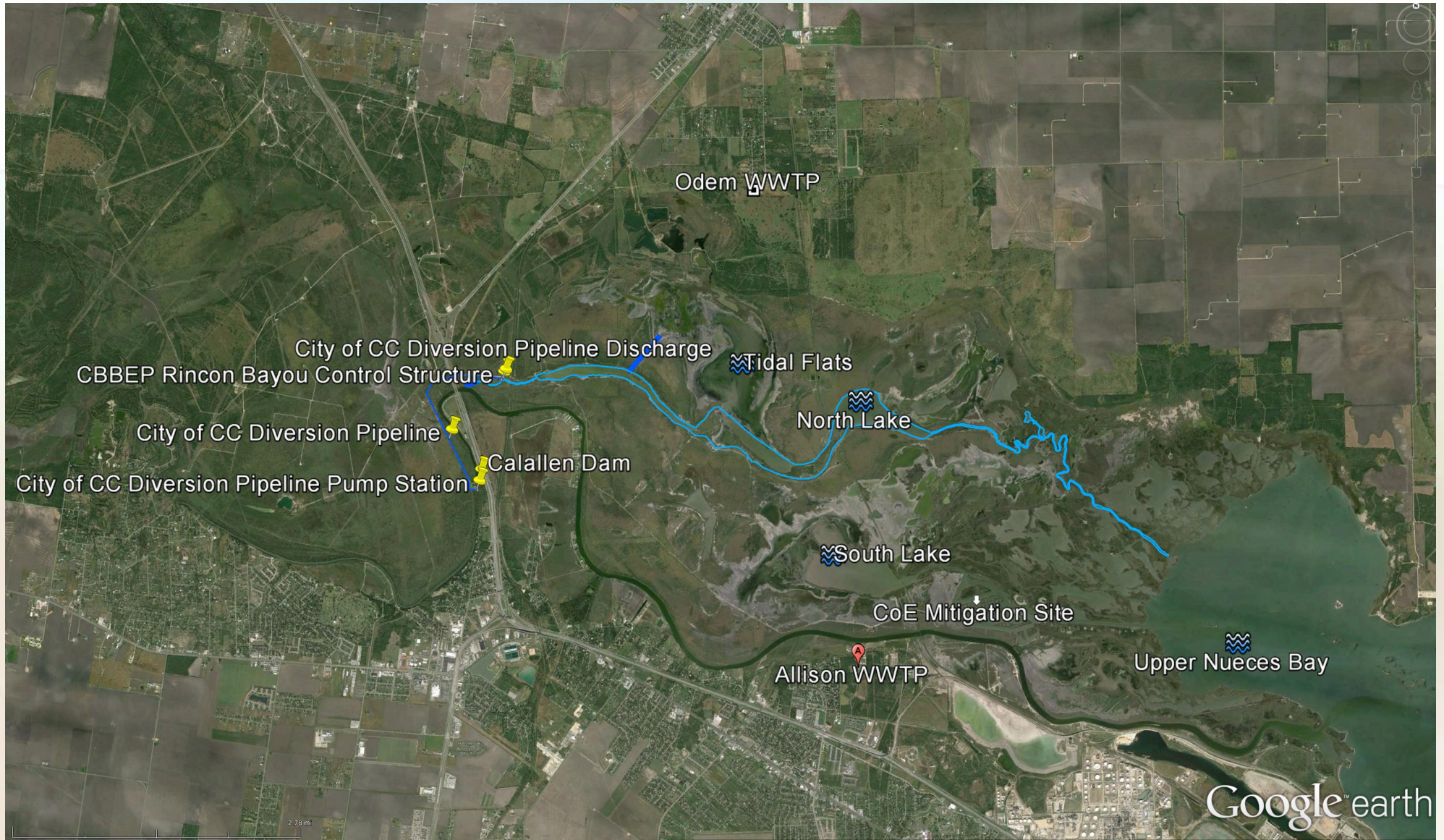
Project Team

- **Naismith-Hanson**
 - **Grant Jackson, P.E.**
 - **James Dodson**
 - **Mary Kay Skoruppa**
 - **Jay Gardner**
 - **Kara Thompson**
 - **Harrison McNeil**
- **Ben Hodges, Ph.D.**
- **Coastal Environments, Inc.**
- **Vega Environmental**

Study Area: Nueces Delta & Upper Nueces Bay



Location of Existing Projects



Review of Previous Study Results

<u>Project #</u>	<u>Project Title</u>
1	<i>Upper Delta Nueces River to Rincon Bayou Diversion</i>
2	<i>Upper Rincon Bayou Diversion to high marsh/wetlands North of Rincon Bayou</i>
3	<i>East end of Upper Rincon Bayou control structure & diversion to South Lake area</i>
4	<i>Middle Rincon Bayou to South Lake Diversion</i>
5	<i>North Lake to South Lake system diversion</i>
6	<i>Lower Delta Nueces River Diversion</i>
7	<i>Diversion of Odem WWTP Discharge and Peters Swale Stormwater</i>
8	<i>Restoration of Allison WWTP Discharge to South Lake</i>
Others	<i>Nueces Delta Face/Nueces Bay Projects; Landform Modifications (as opposed to hydraulic modifications) to create/improve habitat (i.e., excavations)</i>

Review of Previous Study Results

Criteria established to compare alternatives:

- Provided a water column depth of ≥ 1 cm
- Provided an inundation duration of > 6.2 hours
- Provided a salinity of < 25 ppt, < 20 ppt, < 15 ppt

The depth and duration correspond to a typical tidal flooding period.

Modeling Parameters for Simulations

Water from the Calallen Pool discharged into Upper Rincon Bayou via the City of CC's Diversion Pipeline

Upper Rincon Bayou

City of CC Diversion Pipeline

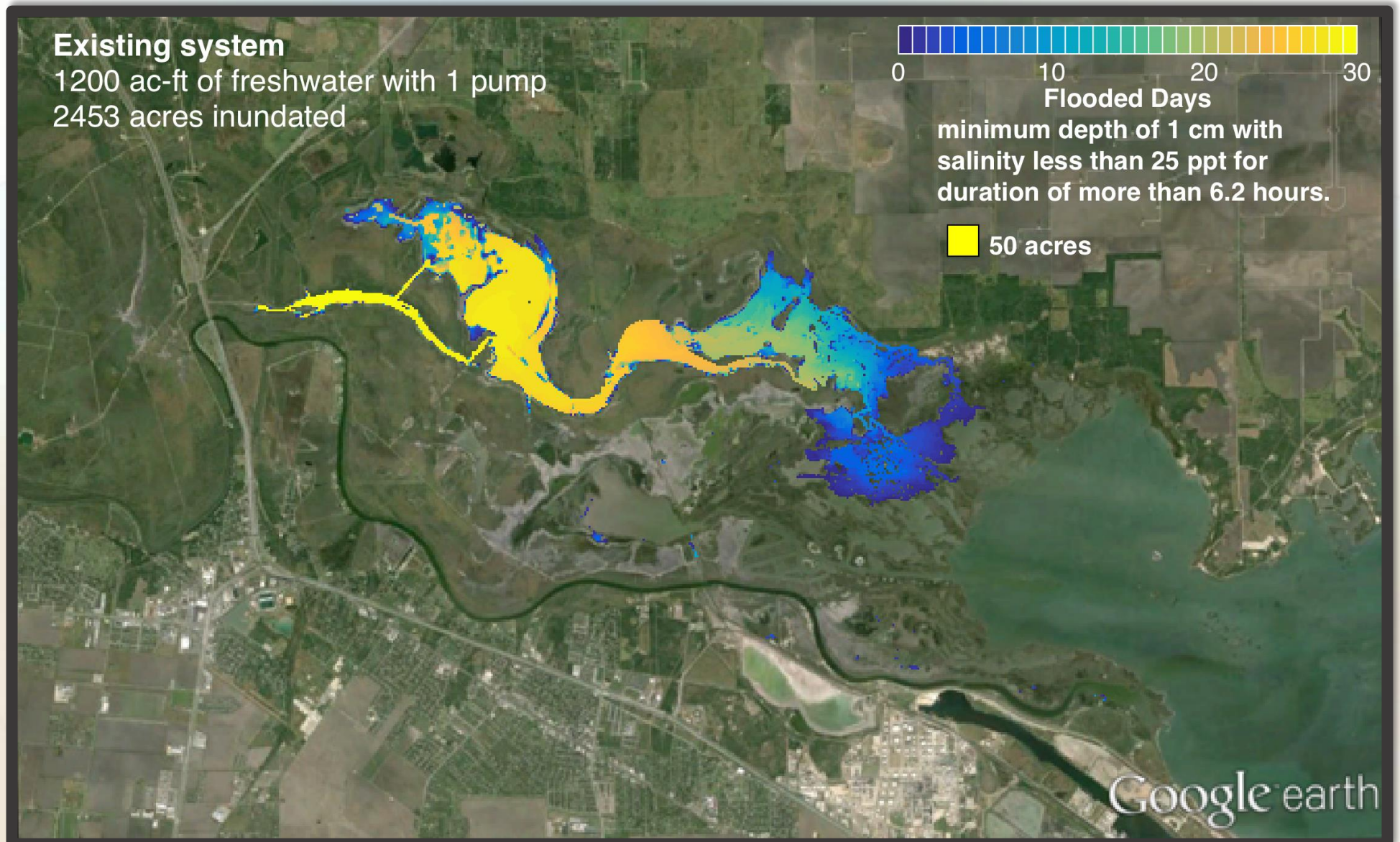
- All pumping was assumed to be using only 1 pump
- Model ran for a 30-day duration in each simulation
- Volumes of 1,200 ac-ft and 3,000 ac-ft were modeled
 - 1,200 ac-ft represents drought period monthly target per the Agreed Order on FW Inflows
 - 3,000 ac-ft represents the maximum physical delivery capacity for the one pump in a 30 day period

Calallen Dam

City of CC Diversion Pipeline Pump Station

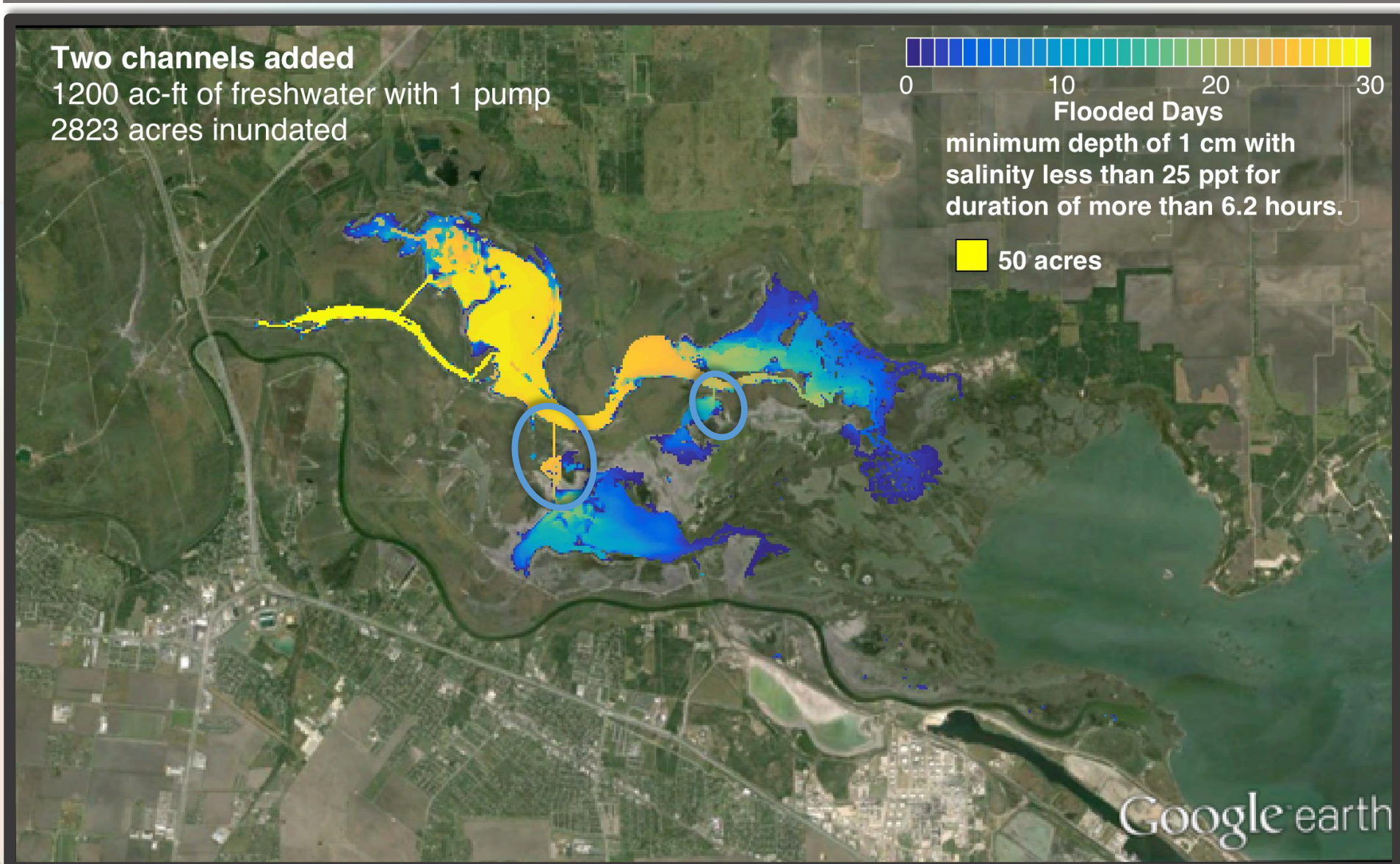
Existing System

1,200 ac-ft | 2,453 acres inundated



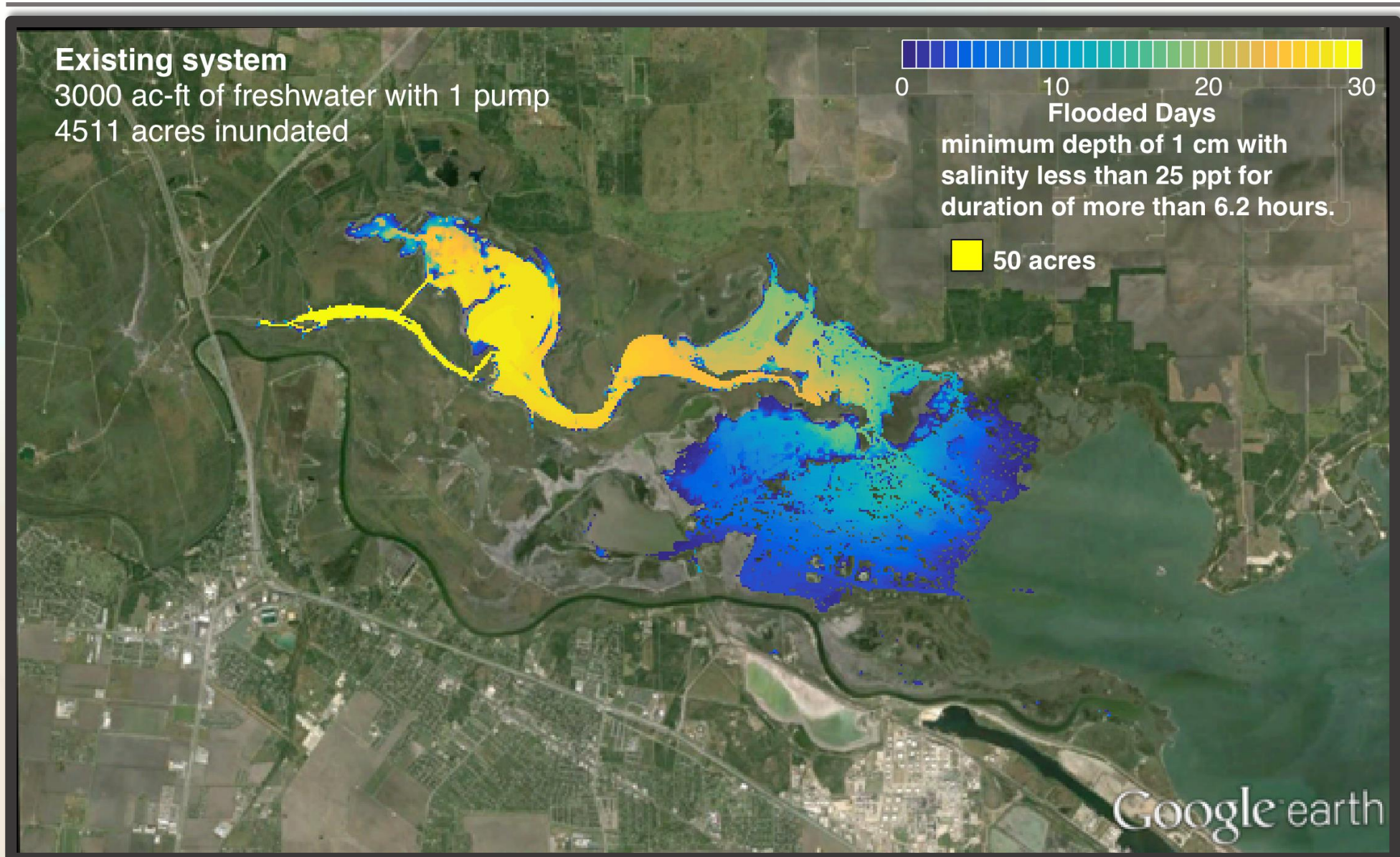
Modified System (Projects 4 & 5)

1,200 ac-ft | 2,823 acres inundated



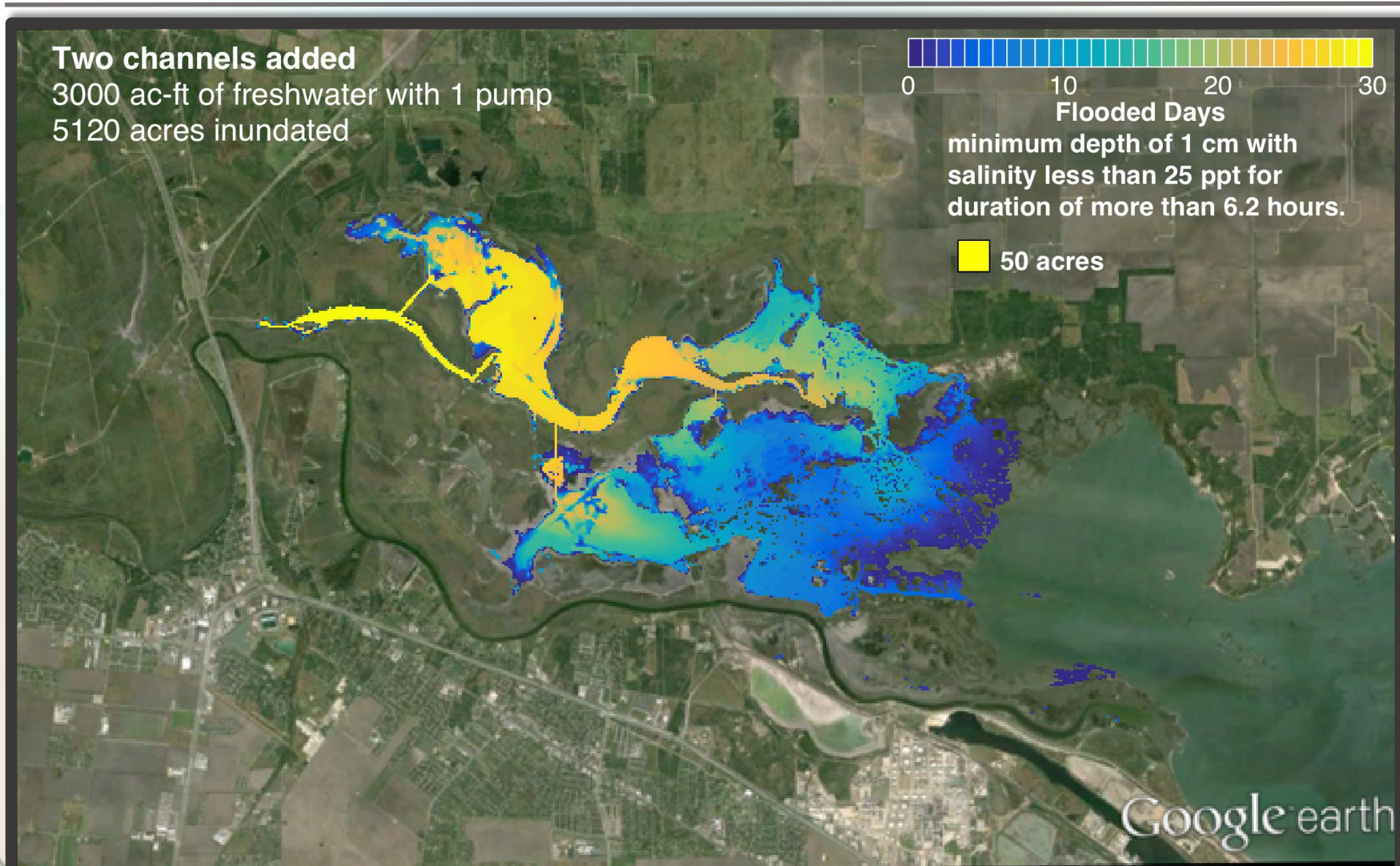
Existing System

3,000 ac-ft | 4,511 acres inundated



Modified System (Projects 4 & 5)

3,000 ac-ft | 5,120 acres inundated



Modified System (Project 4 & 5)

Summary of Results for Varying Salinity Criteria and Volumes Pumped

Salinity Criteria:	< 25 ppt		< 20 ppt		< 15 ppt	
Ac-ft pumped:	1,200	3,000	1,200	3,000	1,200	3,000
New Acres:	720	889	398	1,034	212	882
Lost Acres:	350	279	548	752	436	1,017
Acres in Common w/ Existing System:	2,103	4,323	1,595	3,167	1,314	2,237
Net Addition:	370	610	-150	282	-224	-135

The overall picture is that the simple inclusion of the channels is effective in increasing the area flooded with 20-25 ppt salinity, but at the expense of reducing some of the areas that would otherwise see salinities below 15 ppt.

Phase II: Verification and Feasibility Assessment



Project Tasks:

Task 1: Desktop Review of Environmental Issues and Field Plan Preparation

Task 2: Archeological Desktop Assessment

Task 3: Development of Data Collection Procedures to Evaluate Hydrologic Suitability

Task 4: Field Work – Endangered Species Survey; Nesting Bird Survey; Habitat Characterization; Wetland Delineation; and Collection of Selected Elevation Data Points

Task 5: Data Compilation, Planning, Preliminary Engineering and Regulatory Agency Coordination

Task 6: Final Report Preparation

Project Timetable:

Date	Tasks	Task #
Sept-Oct	<ul style="list-style-type: none"> Desktop review completed Access plan and landowner coordination completed Archeological report completed 	1 1 2
Nov-Dec	Conduct field work: <ul style="list-style-type: none"> Wetland delineations; channel cross section elevations and other selected elevations; habitat and soil characterizations; DMPA site identification; photograph sites and prepare photo logs; evaluate for T&E species 	4
Jan-Feb	<ul style="list-style-type: none"> Compile data Evaluate elevation data (Hodges) Create maps and create channel cross sections Schedule and participate in JEM 	5 3 5 5
Mar-Apr	<ul style="list-style-type: none"> Begin drafting report Conduct nesting bird survey Conduct shorebird survey (PIPL and REKN) 	6 4 4
May - Jun	Complete draft report and submit to TWDB for review	6
July	Revise draft report as needed and submit final report to TWDB	6

Questions?

